



# Job Loss Analysis

**ID No:** 2000298

**Status:** Closed

**Original Date:** 6/8/2012  
**Last Review Date:** 6/11/2012

**Organization:** Global Manufacturing

**SBU:** Global Manufacturing Shared

**BU:** Refining

**Work Type:** Technical Process Engineering

**Title (Work Activity):** Control Valve Resizing

**Site/Region:**

Personal Protective Equipment (PPE)	Selected	Comments
Proper PPE per your Refinery Guidelines	yes	

## Reviewers

Reviewers Name	Position	Date Approved
Allan Zieber	Lead Process EngineerYes	6/2012
John Walker	Sr Process Engineer	6/2012
Michelle Johansen	Global PED JLA Development Team Leader	6/2012

## Development Team

Development Team Member Name	Primary Contact	Position
Allan Zieber	Y	Lead Process EngineerYes
John Walker	Y	Sr Process Engineer

## Job Steps

No	Job Steps	Potential Hazard	Critical Actions
----	-----------	------------------	------------------

1	Obtain and validate control valve data including: • Type • Manufacturer • Model • Serial Number • Full Open CV • Trim Size (reduced vs. full port) • Trim Characteristic (Eq%, Linear, Quick Opening) • Leakage Class • Failure Position • Flange Rating	1. Poor valve performance (resizing objectives not met). 2. Process upsets / possible compromised safety systems.	1a. Obtain control valve data from I&E or other records. 1b. Verify data is correct (field survey). 1c. If CVX data is unavailable contact manufacturer for data. 2. Verify existing failure mode is correct for system.
2	Obtain fluid physical properties (pressure, temperature, density, composition, viscosity, and vapor pressure).	1. Poor valve performance (resizing objectives not met).	1a. Perform flash calculations to determine if flashing is possible anywhere in the system. Note: flashing may be a cause of existing bottleneck. 1b. Provide valve manufacturer with vapor pressure to check for cavitation or flashing in control valve.
3	Define the system (usually between two fixed pressure points). • Highlight system on P&ID or isometric sketch. • Field walk piping and annotate drawing with pipe lengths, valves, elbows, and other fittings that contribute to pressure drop.	1. Poor valve performance (resizing objectives not met).	1. Include upstream/downstream piping, and all fittings in hydraulic evaluation.
4	Perform hydraulic calculations. Determine desired operating flow range (min/norm/max) and available control valve pressure drop for each case.	1. Poor valve performance (resizing objective not met).	1a. If fluid is pumped, use pump curve to determine system head over range of flows. 1b. Include elevation changes in liquid systems. 1c. Provide valve manufacturer with (distinct) available control valve pressure drop for each flow case.
5	Determine if resizing objectives can be met with change of trim only.	1. Unneeded expenditure	1. Verify existing trim size and full open CV and compare to manufacturer's data to determine options.

6	Consult with control valve manufacturer to validate resizing options.	<ol style="list-style-type: none"> <li>1. Excessive noise and vibration.</li> <li>2. Control valve plugging.</li> <li>3. Excessive wear / increased maintenance cost.</li> </ol>	<ol style="list-style-type: none"> <li>1. Verify that control valve manufacturer has performed noise and vibration calculations. This is critical for high-flow, high-pressure-drop applications.</li> <li>2. Notify control valve manufacturer if service is dirty or fouling.</li> <li>3. Notify control valve manufacturer if service is corrosive or abrasive.</li> </ol>
7	Select resize option that will result in operation of valve in stable control range.	<ol style="list-style-type: none"> <li>1. Unstable valve performance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use CVX design standards and manufacturer's guidance to ensure valve will not be required to operate at extreme ends of range (near full-closed or full-open).</li> </ol>
8	Review impact of resize on downstream pressure relief scenarios and PSV ratings.	<ol style="list-style-type: none"> <li>1. Undersized PSV's / potential vessel overpressure.</li> </ol>	<ol style="list-style-type: none"> <li>1. In cases where upstream fluid supply pressure exceeds downstream equipment design pressure, verify that new full-open flowrate does not exceed PSV capacity.</li> </ol>
9	Have I&E Specialist review valve resize proposal.	<ol style="list-style-type: none"> <li>1. Increased cost due to late scope change.</li> </ol>	<ol style="list-style-type: none"> <li>1. Develop material checklist (do you need a new actuator, positioner, other?).</li> </ol>
10	If new valve requires a larger size body, determine what piping modifications are required and have DE start EWO.	<ol style="list-style-type: none"> <li>1. Increased cost due to late scope change.</li> </ol>	<ol style="list-style-type: none"> <li>1a. Field-walk installation to ensure that it will fit.</li> <li>1b. Develop material checklist (do you need new block and bypass valves, double block and bleed in sour service?).</li> </ol>
11	Conduct an MOC/HSE for valve change.	<ol style="list-style-type: none"> <li>1. Possible process upsets.</li> <li>2. OSHA fine (lack of documentation).</li> </ol>	<ol style="list-style-type: none"> <li>1. Verify that change in flow rate will not impact upstream or downstream equipment / processes.</li> <li>2. Include Operations and Maintenance when conducting MOC/HSE.</li> </ol>
12	Enter requisition in system. Reference any special installation instructions.	<ol style="list-style-type: none"> <li>1. Improper installation / rework.</li> </ol>	<ol style="list-style-type: none"> <li>1. Provide special instructions as required. These may include valve orientation (specific to flow), heat tracing requirements (critical for jacketed valves), block and bypass hand-wheel orientation, etc.</li> </ol>
13	Order resized valve (if <\$5k, can be done as expense instead of capital)	<ol style="list-style-type: none"> <li>1. Project delays.</li> </ol>	<ol style="list-style-type: none"> <li>1a. Specify Fisher Valves (preferred provider) unless technical application requires otherwise.</li> <li>1b. Use approved vendors.</li> <li>1c. Review vendor quote to ensure that all data is correct, PRIOR to ordering.</li> </ol>

